

## Section 7

# Environmental Impact Analysis

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I. Have the potential and real adverse environmental effects of the proposed facility been avoided to the maximum extent possible?

The proposed J. Lamar Stall Unit # 1 will be located in an industrial area near an existing power plant. The Plant will provide power to the wholesale electricity market. The generating, cooling, and auxiliary systems have each been designed for maximum efficiency and minimum environmental impact. State of the art combustion turbines (CTs) and heat recovery steam generators (HRSGs) using dry, low NO<sub>x</sub> burners and supplemented with selective catalytic reduction (SCR) systems will be installed at the Plant. These systems will be monitored for air emissions compliance by continuous emissions monitoring systems (CEMS). Cooling will be provided by a bank of cooling towers which require far less water than once-through cooling systems. Other than wastewater, waste generation will be minimal, including almost no hazardous wastes.

A. What are the potential environmental impacts of the permittee's proposed facility?

1. What wastes will be handled?

- a. Classes of chemicals
- b. Quantities (hazardous and non-hazardous)
- c. Physical and chemical characteristics
- d. Hazardous waste classification (listed, characteristic, etc.)

Wastes generated at the plant will include industrial wastewater, plant trash, used oil, and small quantities of universal and hazardous wastes such as batteries, bulbs, paint/solvents, and laboratory wastes.

Small quantities (less than 1,000 gallons) of liquid boiler treatment chemicals will be maintained on site. Boiler blow-down water will not be a hazardous waste and will be discharged with the remainder of the facility's industrial wastewater. Large quantities of liquid cooling tower, water, and wastewater treatment chemicals (greater than 10,000 gallons) will be maintained on site for raw water treatment, cooling tower pH and biological control, and wastewater treatment. No hazardous wastes will be generated by these processes. All of these chemicals will be provided with primary and secondary containment to minimize the possibility of a release. In addition, large quantities (greater than 10,000 pounds) of anhydrous ammonia gas will be stored on site for SCR. Use and storage of this

material will be in accordance with the 40 CFR 68 process safety management (PSM) program to maximize worker and community safety.

**2. How will they be handled?**

- a. Treatment
- b. Storage
- c. Disposal

Wastes, with the exception of pretreatment of industrial wastewater, will not be treated on site. No waste disposal will take place on site. All wastes will be discharged in accordance with the applicable permit or transported off site for final treatment and disposal at approved, licensed facilities. Hazardous wastes will be stored on-site in less than 90-day areas prior to shipment.

**3. Sources of waste**

- a. On-site generation (type and percentage of total handled)
- b. Off-site generation (type and percentage of total handled)

On-site generation will account for 100 percent of the wastes handled at the site. No wastes generated off-site will be handled, treated, stored, or disposed of at the site.

**4. Where will wastes be shipped if not handled at this site?**

The Plant will contract with licensed transporters and disposal facilities for shipping and final disposal of all wastes and recyclable materials generated at the facility.

**5. What wastes will remain on site permanently?**

No wastes will remain on site permanently.

**B. By which of the following potential pathways could releases of hazardous materials from the proposed facility endanger local residents or other living organisms?**

**1. Air**

Although the primary byproduct of the operation of the Plant will be air emission of combustion exhaust gases, the use of sweet natural gas as fuel virtually eliminates the possibility of the release of hazardous materials into the air that could endanger local residents or other living organisms. On the other hand, an accidental release of anhydrous ammonia could, in fact, pose a serious danger to human health and the environment. The

storage and use of anhydrous ammonia on site will be in accordance with the PSM standard, including the required physical and procedural safety measures.

## **2. Water**

Similarly, large quantities of industrial wastewater will be generated and discharged as a result of normal Plant operations. Hazardous materials, however, would only be released to the water in the event of an uncontrolled spill either into the wastewater system or directly off site.

## **3. Soil**

A release of hazardous materials to the soil would only occur in the event of an uncontrolled spill. Hazardous materials stored on site will be provided with primary and secondary containment systems to greatly reduce the risk of an uncontrolled spill.

## **4. Food**

No food is produced in the vicinity of the site so there is no appreciable risk of a release from the Plant affecting food.

### **C. What is the likelihood or risk of such releases?**

The physical and procedural measures that will be in place at the Plant make the likelihood of releases of hazardous materials that might pose a threat to human health or the environment very small. In general, power plants are low risk operations.

### **D. What are the real adverse environmental impacts of the permittee's proposed facility?**

#### **1. Short term effects**

There are no short term adverse environmental impacts anticipated from the proposed facility. Construction and startup of the Plant are not likely to result in un-permitted discharges/releases or waste generation beyond what is normal for industrial construction activities.

##### **a. Land area taken out of system**

The facility will be located on an existing vacant site in an existing industrial area. Rather than a net loss of otherwise useful land area, construction of the Plant will be a beneficial use of currently vacant land.

## 2. Long term effects

The discharge of water contaminants and the release of air pollutants, although done in accordance with the applicable permits, may have long term effects on surface water and/or air quality. These effects will, however, be minimized due to the use of state-of-the-art technologies at the Plant.

II. Does a cost benefit analysis of the environmental impact costs balanced against the social and economic benefits of the proposed facility demonstrate that the latter outweighs the former?

### A. How was it determined that this facility was needed?

1. Local or regional survey
2. On-site or off-site needs
3. Regional solid waste management benefit
4. Generic survey of solid waste needs (compatibility with master plan)

The facility will not accept wastes generated off-site and, as such, will not impact local or regional solid waste needs or master planning. The need for the Plant is based upon the increased demand for electricity in the region and SWEPCO's position in the wholesale electricity market. Investments in power generation using the latest technology help to ensure an adequate electricity supply while minimizing the environmental impact.

### B. What will be the positive economic effects on the local community?

#### 1. How many permanent jobs will be created?

Approximately 11 full-time, permanent, operations and maintenance jobs will be created to staff the Plant.

#### 2. What is the expected annual payroll?

The annual payroll is expected to be approximately \$717,000.

#### 3. What is the expected economic multiplier from item B2?

The RIMSII multiplier associated with new annual direct salaries is 1.9272.

**4. What is the expected tax base and who will receive the benefits?**

Over the 30-year life of the Plant, approximately \$61,000,000 of property tax revenues will go to Parish and City government.

**C. What will be the potential negative economic effects on the local community?**

**1. What are the possible effects on property values?**

Location of the Plant on an existing vacant site near other heavy industrial facilities will have no negative impact upon local property values. The development is a beneficial use of otherwise vacant property and may enhance local property values.

**2. Will public costs rise for**

- a. Police protection**
- b. Fire protection**
- c. Medical facilities**
- d. Schools**
- e. Roads (also see below)**

No increases in public costs are anticipated for the Plant. Large quantities of raw materials and finished products will not be transported to and from the facility over roads. Electricity generation does not generally require additional Police, Fire, Medical, or School resources.

**3. Does the prospective site have the potential for precluding economic development of the area by business or industry because of risk associated with establishing such operations adjacent to the proposed facility?**

The Plant is a low-risk operation which will neither endanger area businesses nor preclude economic development of the surrounding area. Increased electricity availability may, in fact, encourage economic development in the area.

**D. Was transportation a factor in choosing the proposed site?**

Rail, water, and road transportation are not critical to the Plant as natural gas will be supplied by pipeline and electricity will leave via transmission lines.

**1. What model(s) of transportation will be used for the site?**

- a. Truck**
- b. Rail**
- c. Barge**

**d. Other**

Limited truck transportation of supplies, using existing roads, will be used. Transportation to and from the Plant will be minimal. No rail or barge transportation will be needed.

**2. What geographical area will it serve?**

By supplying electricity to the wholesale power market, the Plant will serve a wide geographical area depending upon demand.

**3. By how much will local road traffic volume increase?**

- a. Can local roads handle the traffic volume expected?
- b. Can local roads handle the weight of trucks?

The site location is in an existing industrial area that has adequate roads to handle the small increase in traffic associated with the Plant.

**4. What are the long-term expectations of the proposed site?**

**a. Longevity of the facility**

The design life of the Plant is 30 years.

**b. Who owns the facility**

SWEPCO will be the owner and operator of the Plant.

**c. Are the owners financially backed by others?**

No.

**d. When is closure anticipated?**

The Plant is not a waste treatment, storage, or disposal facility and, therefore, will not require a RCRA closure as such. Assuming completion of construction in 2010, the plant would reach the design life in 2040.

**e. Who is responsible for the site after closure?**

SWEPCO will remain responsible for the Plant for as long as it owns the property.

f. What assurance will there be that the site will be closed in accordance with the plan?

As noted above, no RCRA closure is anticipated and no plan is required.

g. What financial assurance will be established to demonstrate the ability to handle problems after closure?

As noted above, no RCRA closure is anticipated. Once the expected life of the Plant has been reached, SWEPCO or its successors will continue to be responsible for the property. SWEPCO maintains financial assurance to demonstrate the ability to successfully decommission the Plant and address any problems arising afterward.

h. Who certifies that the site is properly closed?

If it ever becomes necessary, SWEPCO will certify that the site is properly closed.

i. How are people protected from unwittingly buying land after closure?

1. Is the closed facility recorded in the deed?
2. What future uses are possible?

As noted above, no RCRA closure of the facility will be required. No on-site treatment, long term storage, or disposal of hazardous wastes will be conducted. Deed recordation will, therefore, not be required. Following decommissioning of the Plant, the site should be suitable for industrial redevelopment.

III. Are there alternative projects which would offer more protection to the environment than the proposed facility without unduly curtailing non-environmental benefits?

A. Why was this technology chosen? (e.g. incineration over landfilling)

1. Are other technologies available?
2. Describe the engineering design and operating techniques used to compensate for any site deficiencies.

The technology chosen for the Plant represents the state-of-the-art in natural gas fired steam electricity generation. There are no known alternatives that would produce electricity more reliably or efficiently. Environmental protection afforded by this technology is superior to other combustion technologies (coal, waste incineration, etc.) and nuclear power generation. No engineering design or operating techniques are needed to compensate for site deficiencies. The site is fully suitable for the proposed use.

**B. Is the proposed technology an improvement over that presently available?**

The proposed technology is the current state-of-the-art incorporating combustion turbines with evaporative cooling air intake, heat recovery steam generators with duct burner capability, and a high efficiency steam turbine. Emissions of NO<sub>x</sub> are minimized through the use of low-NO<sub>x</sub> burners and selective catalytic reduction of exhaust gases. Emissions of SO<sub>2</sub> and PM are reduced through the use of low sulfur natural gas fuel. Emissions of CO and VOC are reduced through good combustion practices.

**C. Describe the sequence of technology used from arrival of wastes to the end process at the facility (flow chart)**

1. Analysis of waste
2. Unloading
3. Storage
4. Treatment
5. Monitoring
6. Closure
7. Post-closure
8. Disposal
9. Any residuals requiring further handling

As stated above, no wastes will be received for treatment, storage, or disposal at the Plant.

**E. Will this facility replace an outmoded/worse polluting one?**

While the Plant is not intended to be a direct replacement of another facility, it will generally serve to enhance the production capacity and environmental performance of the region's power generation fleet.

**F. What consumer products are generating the waste to be disposed? Are there alternative products that would entail less hazardous waste generation?**

Electricity is the "consumer product" produced by the Plant and will be generated using clean technology and fuel. Electricity is an essential commodity that cannot be replaced by an "alternative product". Other technologies and fuels used to produce electricity would result in more waste generation and environmental impact than the proposed Plant.

**IV. Are there alternative sites which would offer more protection to the environment than the proposed site without unduly curtailing non-environmental benefits?**



**A. Why was this site chosen?**

1. Specific advantages of the site
2. Were other sites considered and rejected?
3. Is the location of the site irrevocable; i.e. would denial of permit based on site preclude the project?

The site was chosen for its proximity to an existing SWEPCO facility, the availability of the necessary land, and the availability of water for cooling. The most important of these factors is the proximity of an existing SWEPCO facility. Other sites were, therefore, not considered. Relocation of the project would negate the advantages inherent in the site and would likely preclude the project.

**B. Is the chosen site in or near environmentally sensitive areas?**

1. Wetlands
2. Estuaries
3. Critical habitat
4. Historic or culturally significant areas
  - a. Indian mounds
  - b. Antebellum houses
  - c. Tourist attractions or facilities (e.g. bed and breakfast inns)
  - d. Campgrounds or parks

The site is immediately adjacent to Cross Bayou, within 2.5 miles of Cross Lake, and within one mile of the Red River. The entire surrounding area, however, is mixed use commercial/industrial within the incorporated city limits of Shreveport. No historic or culturally significant areas are known to exist on or immediately surrounding the proposed site.

**C. What is the zoning and existing land use of the prospective site and nearby area?**

1. Is the site located near existing heavy industrial, chemical process, or refinery operations?
2. Is there a precedent for chemical contamination near the site or is the soil and water pristine?
3. Is the area particularly noted for its esthetic beauty?

The zoning and existing land use of the site and the nearby area is industrial. SWEPCO is not aware of historical contamination in the nearby soil and water, but the area has been in

use for industrial and commercial purposes for many years. There is no particular esthetic appeal to the area.

**D. Is the site flood prone?**

**1. Is the site in a flood plain?**

- a. How current are the maps used to make flood plain determinations?
- b. What is the elevation of the site?
- c. Is diking required or desired to provide flood protection?
  1. What is the design height of the dike?
  2. How is the dike protected from erosion?
  3. What frequency and design storm was used?
  4. Is the access to the site over or through dikes?

The latest FEMA flood insurance rate map for the area (map number 22017C0369 F, effective April 6, 2000) shows the proposed site to be outside of the 100 and 500-year flood zones of Cross Bayou. The site elevation is approximately 200 feet above mean sea level.

**2. Is the site hurricane vulnerable?**

- a. Is the site in an area subject to storm surge?
- b. What are the design storm specifications?
- c. Should damage from wave action be considered?
- d. For what levels of wind speed is the facility designed?

The site is located sufficiently far from the coast so as not to be particularly vulnerable to hurricanes. The structural design of the Plant is in accordance with the applicable building code with respect to storm and wind speed design. Wave action is not a concern at the site.

**E. Is groundwater protected?**

**1. Are aquifers or recharge areas underlying the site used for drinking water?**

No, the City of Shreveport supplies drinking water to the area that is derived exclusively from treated surface water.

**2. What is the relationship of the site to the water table?**

The site draws from and discharges to surface waters immediately adjacent to Cross Bayou. The site has neither withdrawal nor injection wells and will not interact with the groundwater.

**3. What wells exist in the area?**

SWEPCO is not aware of wells in the area. No wells exist or will be drilled on the site.

**4. What is the flow rate and direction of groundwater flow?**

Although SWEPCO's geotechnical study of the site did not include enough soil borings to determine groundwater flow direction and rate, it is reasonable to expect that the shallow groundwater is flowing north toward Cross Bayou assuming that the Bayou is a gaining stream.

**5. What is the groundwater quality in the underlying aquifers?**

Groundwater was not sampled during the geotechnical study. The State of Louisiana Water Quality Management Plan Water Quality Index Section 305(b) Report from 1996 listed the Red River alluvial and Carrizo-Wilcox aquifer systems as underlying Caddo Parish. The shallower alluvial aquifer (well depths of 30-500 feet) is recharged by direct infiltration, lateral and upward movement from adjacent and underlying aquifers, and stream flooding. Flow is down-gradient toward rivers and streams. The primary use of this water is for agriculture as it contains significant hardness and can be salty in places. The deeper Carrizo-Wilcox aquifer (well depths of 200-900 feet) consists of the Carrizo Sand and the undifferentiated Wilcox Group. Recharge occurs from direct infiltration and movement from overlying alluvial aquifers. This aquifer is a source of fresh groundwater for domestic and public supplies in northwestern Louisiana. The City of Shreveport, however, does not withdraw from this aquifer.

**6. Is there a hydraulic connection between the aquifers?**

Yes, the aquifers are known to recharge each other.

**F. Does prospective site pose potential health risks as defined by proximity to:**

1. Prime agricultural area (crop or pasture land)
2. Residential area
3. Schools or daycare centers
4. Hospitals or prisons
5. Public buildings or entertainment facilities
6. Food storage areas
7. Existing community health problems that may be aggravated by operation of additional hazardous waste disposal capacity

Residential and industrial areas are located near the proposed site and may be potentially at risk. As noted above, the storage and use of anhydrous ammonia for emissions control is the only significant health risk in the event of an uncontrolled release. Use and storage of this material will be in accordance with the 40 CFR 68 process safety management (PSM) program to maximize worker and community safety. No hazardous waste disposal capacity is proposed for the site.

**G. Is air quality protected?**

**1. Is the site within an ozone or non-attainment area?**

No, the Shreveport area is in attainment with the National Ambient Air Quality Standards.

**2. What contaminants are likely to be generated at the site?**

Air emissions of exhaust gases will consist of typical combustion products from natural gas, i.e. nitrogen and sulfur oxides, particulate matter, carbon dioxide and monoxide, and ammonia slip from the use of SCR.

**3. What protection is afforded from each contaminant generated by the site?**

The proposed Plant will use the Best Available Control Technology (BART) to limit and control air emissions. This includes the use of low-NO<sub>x</sub> burners, SCR, and low-sulfur fuel. To ensure compliance with permitted limits on all contaminants, fuel flow will be measured for all units and a Continuous Emissions Monitoring System (CEMS) will be installed and operated on the turbine units. Excess emissions and deviations will be reported in accordance with the applicable regulations.

**4. What is the potential for unregulated emissions?**

The use of CEMS and fuel monitoring as a real-time compliance tool dramatically reduces the potential for unregulated emissions and provides instant notification to Plant operating personnel in the event of a problem.

**5. What plans are implemented to provide for odor control?**

No significant odors are expected from the operation of the Plant. There are no plans for odor control measures.

**6. Who will be affected by emissions?**

**a. What is the direction of the prevailing winds?**

**b. Describe the expected frequency of "bad air" conditions**

The Tyler, Texas wind rose shows the prevailing winds to be from the south while the Baton Rouge, Louisiana wind rose shows the prevailing winds to be from the southeast. The site, therefore, should experience prevailing winds from one of these directions. No "bad air" conditions are anticipated and the operation of the Plant should not trigger any "ozone action" or other air quality response situation.

**7. Describe control of vapors at various stages of the process**

Vapors and/or fugitive emissions will be controlled by good operating and maintenance practices to repair and prevent leaks. No processing of wastes that will cause vapor emissions will take place at the Plant.

**H. Have physical site characteristics been studied; what has been done in terms of a geotechnical investigation?**

1. Site geology
2. Hydrology
3. Topography
4. Soil properties
5. Aquifer location
6. Subsidence problems
7. Climatic conditions

A groundwater certification is required and will be submitted to LDEQ under separate cover. A geotechnical investigation has been conducted. Subsurface conditions at the proposed site were explored via one test boring to a depth of 80 feet. The boring was advanced utilizing a hollow stem auger and samples were obtained at various intervals. The boring log indicates that beneath 6 inches of topsoil, sand with varying amounts of clay was encountered to approximately 4 feet, followed by clay that interchanged from fat to lean with varying amounts of sand. The clays were firm to very stiff to approximately 13 feet and then hard below 13 feet. The USGS North Highlands, Louisiana quadrangle shows the site elevation to be approximately 180 feet above mean sea level. The site slopes gently down to the northeast toward Cross Bayou. Aquifers are discussed in item E 5 above. Climatic conditions are acceptable for operation of the Plant as evidenced by the existing SWEPCO facility.

**V. Are there mitigating measures which would offer more protection to the environment than the facility as proposed without unduly curtailing non-environmental benefits?**

A. Is this facility part of a master plan to provide waste management? Who's plan?

1. How does it fit into the plan?
2. What geographical area is served by the plan?

This facility has no relationship to waste management planning. No wastes will be treated or disposed on site.

B. Does this facility fit into an integrated waste management system? (reduction, recovery, recycling, sales tax, exchange, storage, treatment, disposal)

1. On-site
2. Regional

This facility has no relationship to any waste management system. No wastes will be treated or disposed on site.

C. Can waste be disposed in another fashion?

1. Technology limitations
2. Cost factors
3. Other reasons

No wastes will be treated or disposed on site.

D. What quality assurance control will be utilized to protect the environment?

1. Plans for lab work
2. How are out-of-spec wastes handled?
3. What happens to rejected wastes?
4. Treatment stabilization
5. Segregation of non-compatible wastes
6. Handling of containerized wastes

No wastes will be treated or disposed on site. Wastes generated on site will be handled, stored, and shipped off site for proper disposal in accordance with the applicable regulations.

E. Innovative techniques used to control release of waste or waste constituents into the environment

1. Surface impoundment
2. Land application treatment
3. Landfill (burial)
4. Incinerator
5. Container storage
6. Tanks

This facility has no relationship to waste management planning. No wastes will be treated or disposed on site.